Joint Expeditionary Force Experiment 2004

Welcome to the JEFX 04 Initial Planning Conference.

The Air Force has a rich heritage of innovation and transformation. That legacy will continue during this experiment as we identify, assess, make recommend- ations, and field critical capabilities for our warfighters.

I'm sure you will agree the efforts to be made in the coming months will pay dividends not only to the warfighters, but to our service, sister services and nation.

I trust that each and every member of this team will be committed to the experimentation process and accelerating the capabilities that best meet the Battle Management Command and Control vision.

Maj. Gen. Robert F. Behler, Air Force C2 & ISR Center Commander

Direction from the CSAF

CSAF directed JEFX 04 to focus on Battle Management Command and Control (BMC2) with an emphasis on air and space integration.

"It's not about platforms, sensors and nodes. It's about supporting the Joint Force Commander by increasing air & space power through information integration."

CSAF Conceptual View
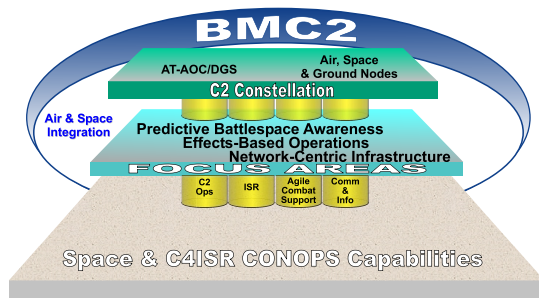
## Battle Management Command and Control

BMC2 is people executing processes using the components of the Command and Control Constellation (C2 Constellation) to execute the warfighting tasks of find, fix, track, target, engage and assess (F2T2EA). The intent of the integrated BM, C2 and Intelligence, Surveillance and Reconnaissance (ISR) systems is to

shorten timelines between information collection and action to achieve planned effects, exploiting the dynamic capabilities of today's weapons and leading to decision superiority.

There is an unprecedented explosion of information available to commanders today.

During the WWI, telephone traffic allowed about 30 words per minute of information. In contrast, approxi- mately 192,000 words per minute were transferred during Gulf War I, and it is estimated that by 2010, the equivalent of 1.5 *trillion* wpm will be transferred.

The Challenge
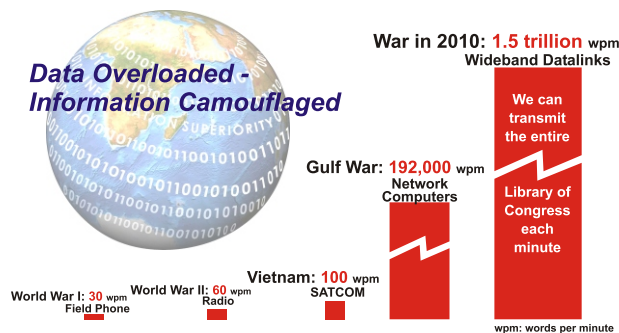
The challenge is to transform this information explosion by focusing people, processes and technology to get the right information to the right person at the right time to get weapons on target.

The Air Force goal is to accelerate this process through both vertical and horizontal information sharing: vertically, between sensors and command centers; horizontally, among the sensors and platforms.

"Zero latency in this environment is our goal; it will afford instantaneous strike capability, and will save lives." Gen. John Jumper

Command and Control Constellation

The C2 Constellation is the Air Force response to today's data/information overloaded battlespace environment.

The C2 Constellation will harness the power of networks and revolutionize combat operations by linking sensors, communications systems, and weapon systems in an

interconnected grid that creates seamless information flow to the warfighter.

Many of the assets in the C2 Constellation are not new. What is new is how their separate capabilities will be integrated by connecting an *array* of ground, air and space-based sensors that use common standards and communications protocols to relay information automatically through machine-to-machine interfaces (M2M).

This new integration approach to air warfare will achieve the desired battlespace effects for the Joint Force Commander (JFC).

Air & Space Operations Center and Distributed Ground Station

The nodes of the C2 Constellation, on which there will be heavy concentration in this experiment, are the Air and Space Operations Center, the Distributed Ground Station, and air and space platforms.

JEFX 04 will explore closely the interaction between these weapon systems, as well as, other nodes of the C2 Constellation. The objective will be to enhance the kill-chain process, including non-kinetic, effects-based operations.

Within this construct, we will focus on three key attributes of BMC2: Predictive Battlespace Awareness (PBA), Effects- Based Operations (EBO), and Network- Centric Infrastructure (NCI).
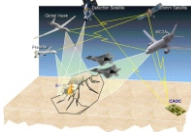
Predictive Battlespace Awareness

PBA is an improved analysis and decision-making process consisting of four elements: Intelligence Preparation of the Battlespace, ISR strategy and planning, ISR employment, and Target Development.

PBA and the Kill Chain
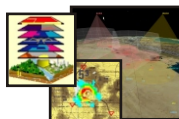
Assess
- Various assessments against PBA baseline

Find, Fix
- IPB - Focus, Anticipate
- Mitigate/optimize battlespace effects
- Persistent ISR - Horizontal/Vertical integration

Track
- Sensor mix and sequencing ISR ops (e.g., Cross-cue & dynamic tasking)

Engage
- Situation awareness and risk assessment
- Reattack/Rerole

Target
- Target priorities and situation refinement
- Correlating ATO for strike packages
- Identify BDA asset

- Battlespace observation refinements (e.g., Movement projections)

Knowledge provided through PBA enables the JFC and staff to correctly anticipate future conditions, assess changing conditions, establish priorities, and exploit emerging opportunities while mitigating the impact of unexpected adversary actions.

Effects-Based Operations

EBO is an approach to military operations that focuses on the results of the desired effects explanation of how those results came about rather than the actions (e.g., sorties flown, rounds fired, or tons of relief materials delivered) of military operations.

Essential to an effects-based approach is an understanding of how actions affect the adversary's behavior. Effects-based thinking involves turning the blue commander's intent into purposeful actions, then assessing the outcomes, both intended and unintended, in light of attaining the commander's objectives and desired effects.

"Effects-based operations have the potential to reduce the force requirements, casualties, duration of conflict, forward basing, and deployment of forces previously required to prevail in war…. It is the philosophy of control over an adversary's strategic activity and the commensurate disruption of his decision-making process by direct influence and effect on the adversary's ability to act."
Maj Gen David Deptula

Network-Centric Infrastructure

What makes BMC2 transformational is the underlying NCI.. the true networking of our C2 Constellation.

Currently, most components of our Command and Control, Communications, Intelligence, Surveillance, and Reconnaissance (C2ISR) and battle management

systems are connected to some sort of network, they are not *networked*.

To achieve the potential power of a networked C2 Constellation for both air operations and the entire joint force, it is necessary to understand the power of networks and network centric warfare.
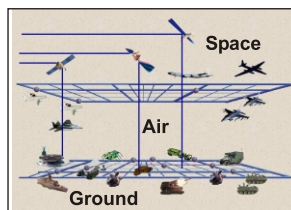
Transforming AF C4ISR: Harnessing the Constellation

- Understand the power of networks ...
"The power of a network increases in proportion to the square of the number of nodes on the network"

Space

Air

Ground
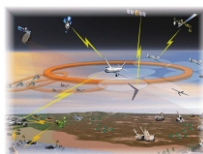
$$C = f\,(N, I^2, BMC2)$$

$$C_{pwr} = f\,(I, B_w, t)$$

- ... to harness the power of the Constellation:
Depends on a network of integrated information (I^2), sensors and platforms (N) applied through BMC2

Metcalf's Law states that the power of a network increases in proportion to the square of the number of nodes.

The power of NCI is that it provides, not only *connectivity*, but also "conversations between the "machines" of the C2 Constellation, i.e. machine-to-machine (M2M) exchange.

M2M exchanges can speed the flow of information from sensor to decider, to shooter, even directly from sensor to weapon. Machines communicate faster and increase both the accuracy and velocity of combat information.

JEFX 04 will provide a venue to experiment with and assess new, innovative or refined concepts, processes, technologies, tactics, techniques and procedures that may provide solutions to integration of air, space, and ground assets.

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... where the legacy continues